In re Patent Application of:
MORSE ET AL.
Serial No. **10/718,908**
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In the Specification:

Please replace paragraphs 0034 and 0035 with the following rewritten paragraphs:

[0034] FIG. 15 is a partial cross-sectional side view showing a ~~second~~ first, GRIN lens-coupled embodiment of the optical coupler in accordance with the present invention.

[0035] FIG. 16 is a partial cross-sectional side view showing a ~~first~~ second, prism-coupled embodiment of the optical coupler in accordance with the present invention.

Please replace paragraphs 0073 and 0074 with the following rewritten paragraphs:

[0073] In one embodiment, the optical coupler **64** comprises a prism ~~element~~ **80** and GRINS lens-coupled elements **81** for focusing and redirecting optical energy supplied by the optical pump sources **74** into the respective optical waveguides **20** in the substrate **12**, as best illustrated in FIG. 15. The prism ~~element~~ **80** is held in place within the optical coupler **28** using a bracket type assembly (not shown), as readily appreciated by those skilled in the art. Of course, other means for holding the prism ~~element~~ **80** in place are also acceptable. The optical coupler **28** has an opening **43** that is rectangular configured and includes attachment tabs **51** having

guide holes that receive alignment pins **55** for interfacing with optical pump sources **74** via an MTP connector **62**.

[0074] The prism ~~element~~ **80** extends across the substrate **12** so that it extends across the optical waveguides **20**. The prism ~~element~~ **80** directs spatially adjacent (e.g., parallel) beams of optical energy into the respective optical waveguides **20** in the substrate **12** from a direction that is generally transverse to the waveguides. By optically transverse is meant in a direction that forms an acute angle with the direction of an optical waveguide **20**, and is typically greater than zero and less than or equal to 90°.

Please replace paragraph 0078 with the following rewritten paragraph:

[0078] Still referring to FIG. 15, an MxN array of ~~micro-lenses or diffractive optic elements (DOEs)~~ GRIN lens-coupled elements **81** are distributed over (e.g., directly etched into or provided on a separate light transmissive layer that is attached to) a receiving surface of the prism ~~element~~ **80**. Each ~~micro-lens or DOE~~ GRIN lens-coupled element **81** focuses its associated pumping energy beam along a prescribed refraction path through the bulk material of the prism ~~element~~ **80** and onto a generally planar surface of the prism that directly abuts the top reference surface **16** of the substrate **12**. The parameters of the focusing elements ~~(e.g., micro-lenses, DOEs)~~ and the geometry and refractive index of the prism ~~element~~ **80** are defined such that each focused pumping

beam emerges from the prism surface in a direction through the optical waveguide **20** that effectively redirects and confines the pumping beam therein.

Please replace paragraph 0081 with the following rewritten paragraph:

[0081] A second~~, gradient indexed (GRIN) lens-coupled~~ prism embodiment **86'** of the optical coupler **64'** is illustrated in FIG. 16. As in the first embodiment, a pumping energy coupling interface is configured to focus spatially adjacent beams of optical pumping energy generated by an array of pumping energy sources **74** into the respective amplifying optical waveguides **20** from a direction transverse to the channels. Except for the use of a prism and associated micro-lens array as the coupling interface, the remainder of the structure of the second embodiment is the same as that of the first embodiment.

Please replace paragraph 0083 with the following rewritten paragraph:

[0083] Like the ~~prism and associated micro-lens array of the first embodiment and the GRIN lens array of the second embodiment~~ previous embodiments, the lenslet array **90"** of diffractive optic elements (DOE) causes each pumping beam to be focused into a respective optical waveguide **20** in a direction that effectively confines the injected pumping beam within the optical waveguide during its propagation through

the waveguide, so that the energy in the pumping beam will be transferred to and thereby amplify the signal beam, as the injected pumping beam repeatedly passes back and forth between the cladding layer **63** and the signal-transporting core **61**.